

# NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

July 6, 2011

# Precipitation and Snowpack

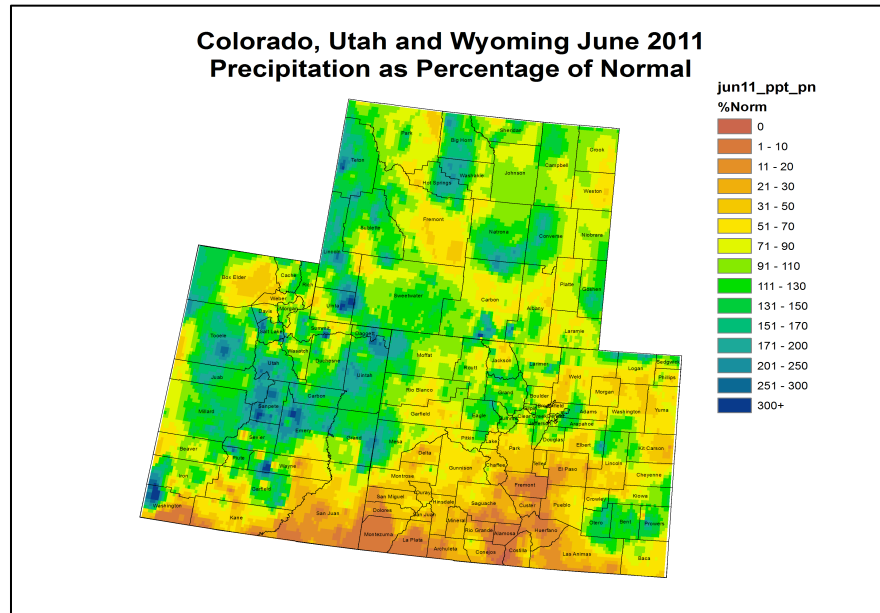


Fig. 1: June precipitation as a percent of average.

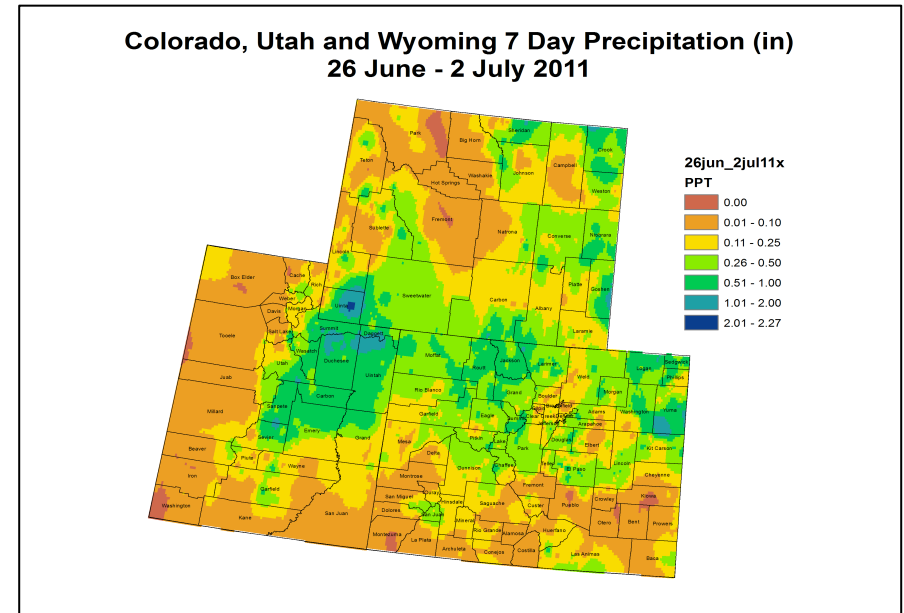


Fig. 2: June 26 – July 2 precipitation in inches.

For the month of June, much of the northern portions of the Upper Colorado River Basin (UCRB) received between 100% to 200% of their average precipitation (Fig. 1). The Four Corners was the driest region of the basin for the month, receiving less than 30% of average. The San Luis Valley was also very dry for the month, only seeing about 10% of its average precipitation. Much of eastern Colorado received between 50% and 100% of average precipitation for the month, with parts of southeastern CO seeing over 100% of average from just a couple of storms.

Last week, the heaviest amounts of precipitation fell over northeast Utah and southwest Wyoming with amounts totalling between half an inch to over 2 inches in some spots (Fig. 2). The mountains of northern CO and northeast CO received between a quarter inch to an inch of moisture for the week. The drought stricken areas in the southern portion of the UCRB and in southern CO remained dry, seeing less than a tenth of an inch over the week.

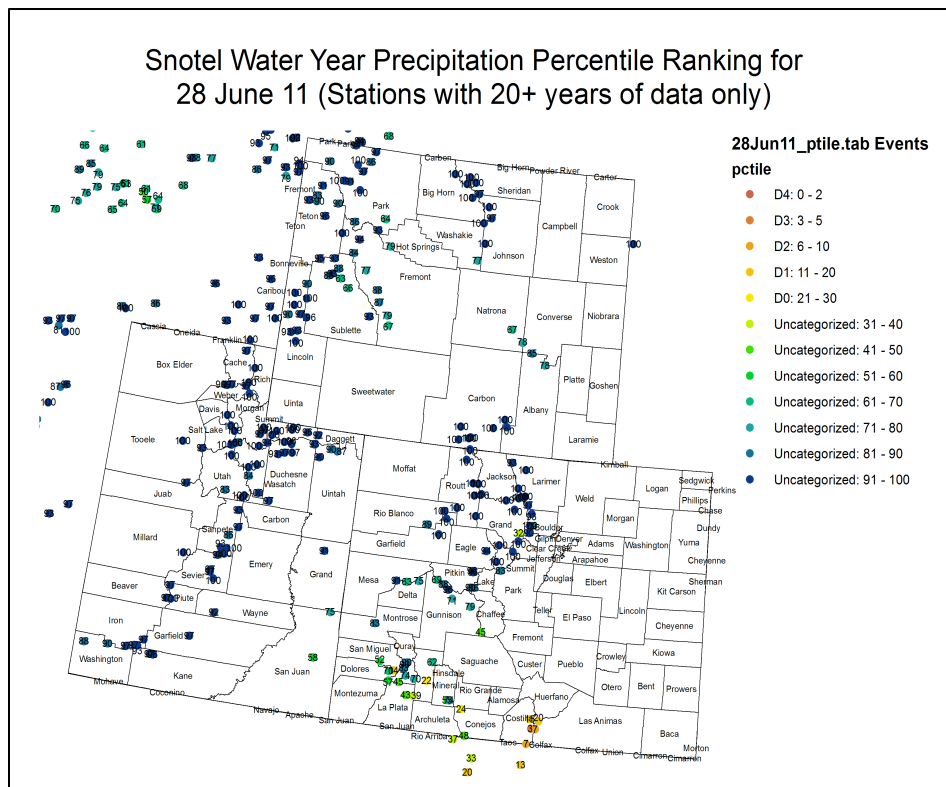


Fig. 3: SNOTEL WYTD precipitation percentiles (50% is median, 21-30% is Drought Monitor's D0 category).

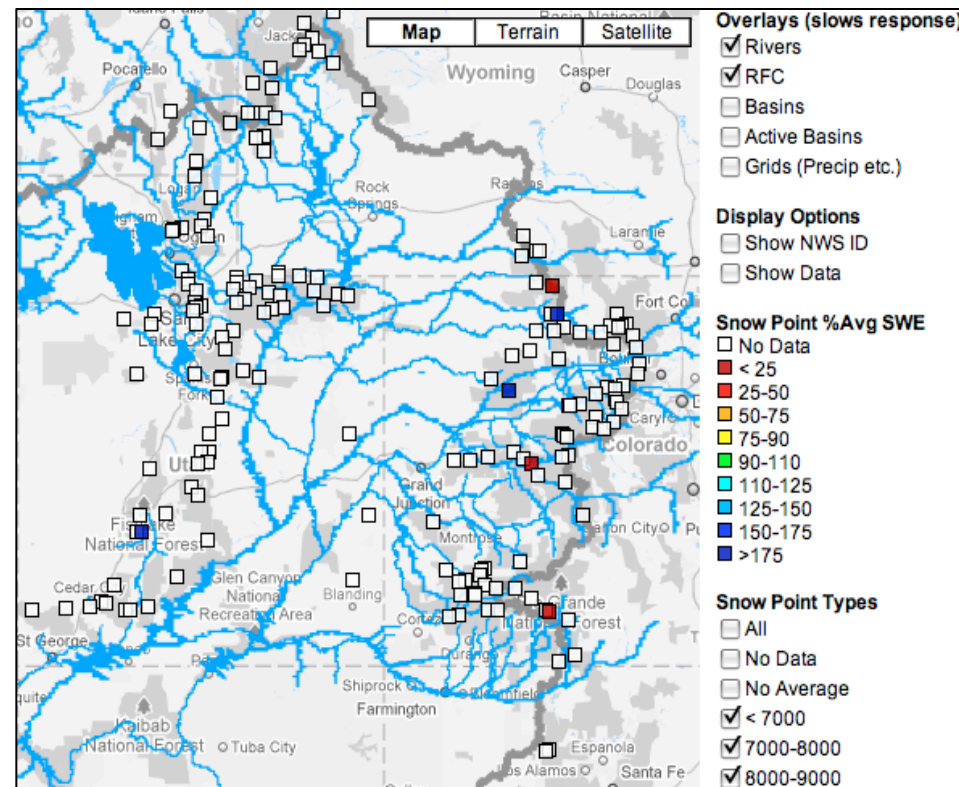


Fig. 4: SNOTEL WYTD accumulated snow water equivalent as a percent of average.

The majority of the SNOTEL sites in the UCRB are showing very high (and in many cases, record high) percentile rankings for water-year-to-date (WYTD) precipitation (Fig. 3). The Rio Grande and San Juan basins in southern CO are the driest, though the higher elevations of the San Juan basin have improved somewhat from the earlier part of the water year. Several sites in the Sangre de Cristos show percentiles worthy of D1 – D2.

After a near record season high for snowpack in the UCRB, the majority of the SNOTEL sites have now completely melted their accumulated snowpack for the season (Fig. 4 – white squares indicate sites that have completely melted out). Only a few higher elevation sites have remaining snowpack left on them– the Tower site in the Yampa River basin still has over 30 inches of snow water equivalent.

# Streamflow

As of July 4<sup>th</sup>, about 95% of the USGS streamgages in the UCRB recorded normal (25<sup>th</sup> – 75<sup>th</sup> percentile) or above normal 7-day average streamflows with over 70% of the gages recording flows above the 75<sup>th</sup> percentile (Fig. 5). As of July 5<sup>th</sup>, 1 gage was still exceeding the National Weather Service flood stage—the Green River at Green River, UT site. Many of the gages in the northern part of the UCRB are still recording real-time flows at or above the 99<sup>th</sup> percentile, while flows in the southern part of the basin have receded.

Key gages on the Colorado River near the CO-UT state line and the Green River at Green River, UT have above normal 7-day average streamflow at the 93<sup>rd</sup> and 96<sup>th</sup> percentiles, respectively (Fig. 6). Streamflow on the San Juan River near Bluff, UT is at the 47<sup>th</sup> percentile. Flows on the San Juan had decreased as a response to the decreased releases from Navajo combined with the lower snowpack now being completely melted out.

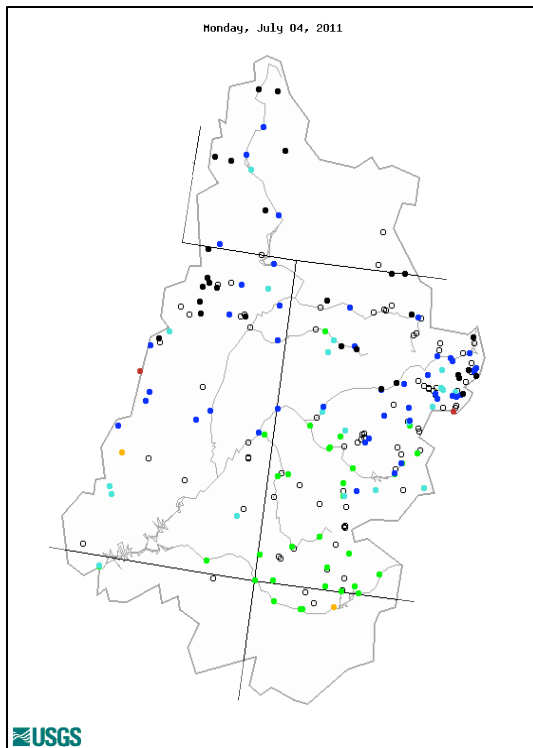
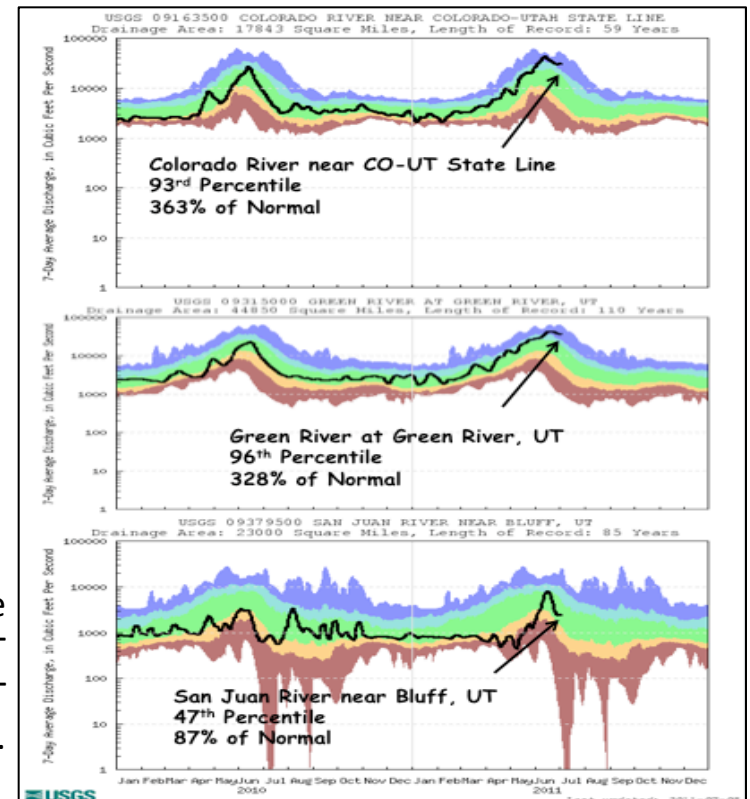


Fig. 5: 7-day average discharge compared to historical discharge for July 4<sup>th</sup>.

Fig. 6: USGS 7-day average discharge over time at the CO-UT stateline (top), Green River, UT (middle) and Bluff, UT (bottom).



## Water Supply and Demand

Last week, above average temperatures were seen across most of the UCRB and eastern plains of CO. Much warmer temperatures (6° to 8° above average) were observed over the Four Corners and southeastern CO. Soil moisture conditions remain poor for the San Luis Valley. Soil moisture is above average along the Wasatch range in UT, in the northern CO mountains, and in northeast CO (Fig. 7). Soil moisture models indicate improved conditions over southeast CO as a response to the one storm two weeks ago—these models are likely erroneously overestimating moisture that is not actually being observed in the region.

All of the major reservoirs in the UCRB have experienced rapid storage increases in June. Daily inflows into Flaming Gorge, Blue Mesa, and Lake Powell are all well above their averages for this time of year. Inflows into Navajo have dipped below their average for this time of year. Lake Powell has seen large increases in volume and is now at 83% of average. It is projected that Lake Powell's elevation will continue to rise through late July—projected elevation levels would be the highest they've been since October 2001.

## Precipitation Forecast

Since the 3<sup>rd</sup> of July, a pattern shift has resulted in the influx of subtropical moisture into the UCRB and surrounding areas. This wetter pattern will continue through Thursday, bringing scattered showers and thunderstorms throughout the region with widespread totals between a tenth and a quarter of an inch. Locally heavier amounts and possible flash flooding in a few spots can be expected. As an upper low moves into the Pacific Northwest on Friday, the subtropical moisture plume in the UCRB will shift to the south and east. By Sunday, the western edge of the subtropical moisture will extend from near the Four Corners up through south-central WY. Areas west of this line will see a significant drying trend, with only a few late-day thunderstorms possible. Another trough will move into the Pacific Northwest early next week and will bring drier southwesterly flow into the UCRB. Significant moisture will still be persistent for far eastern CO.



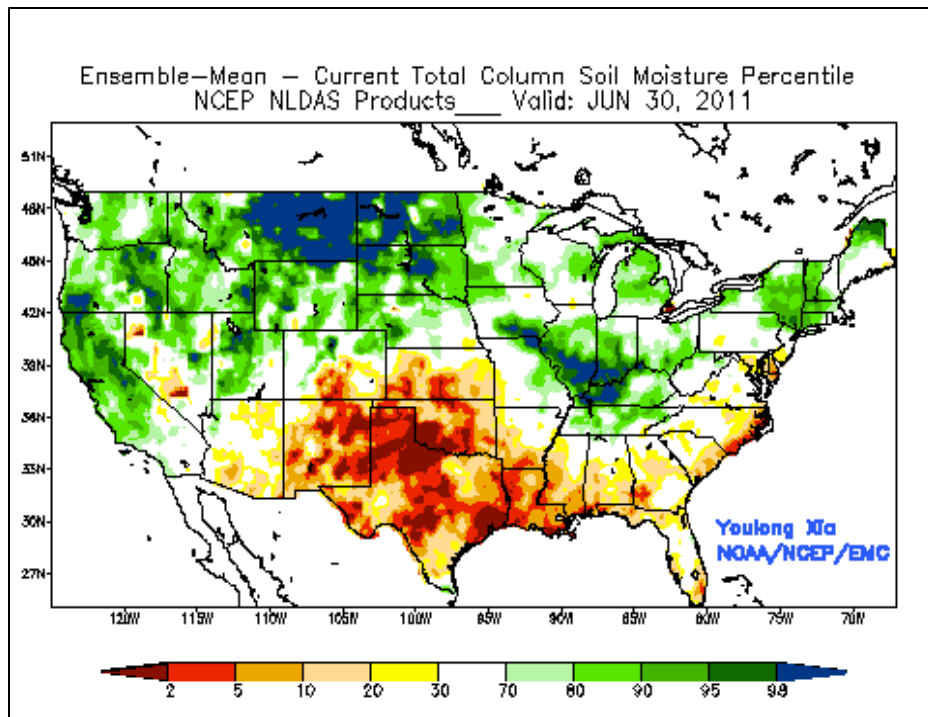


Fig. 7: NLDAS total column soil moisture percentiles for June 30<sup>th</sup>.

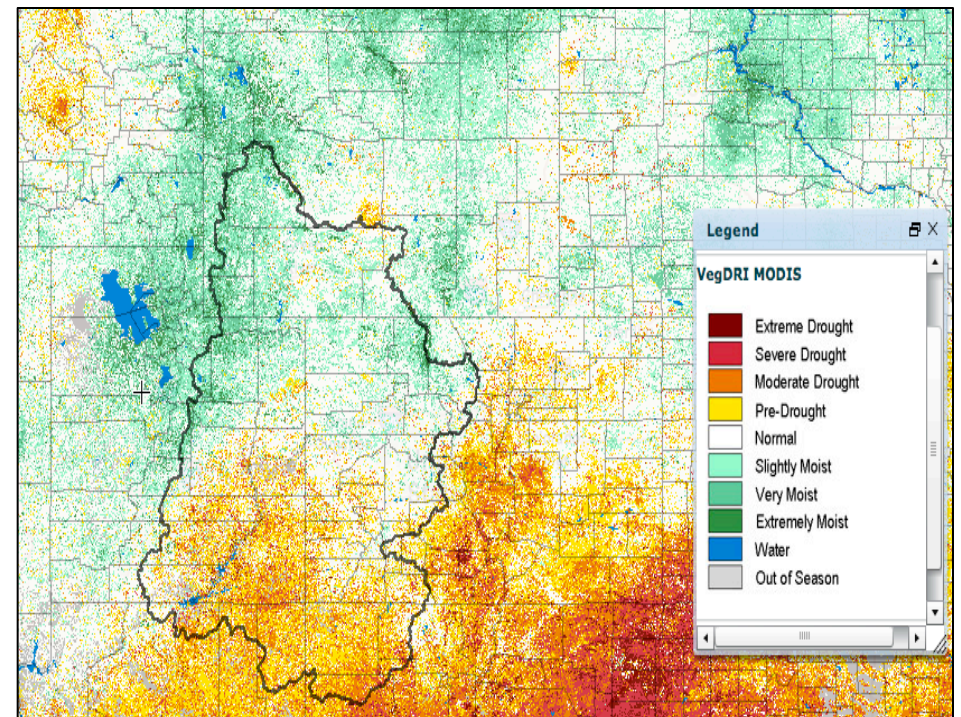


Fig. 8: June 27<sup>th</sup> VegDRI map, based on satellite-derived observations of vegetation.

# Drought and Water Discussion

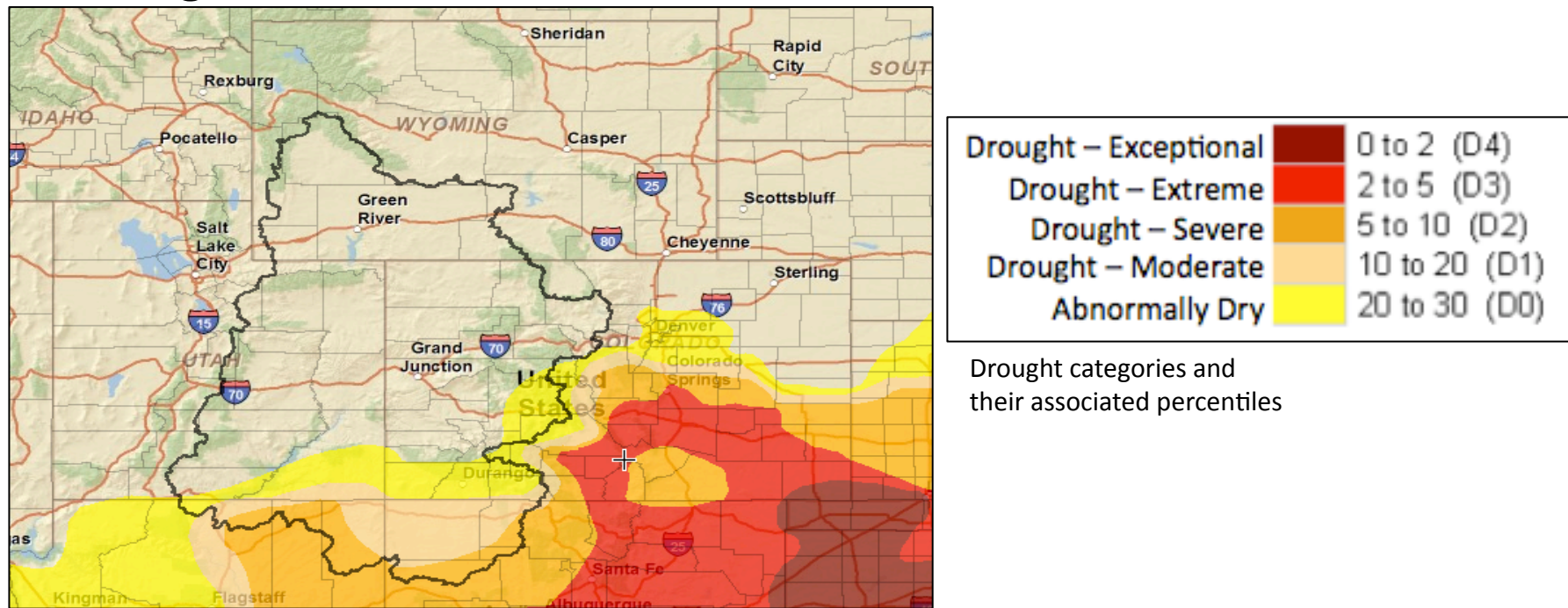


Fig. 9: June 28<sup>th</sup> release of U.S. Drought Monitor for the UCRB

In the UCRB, the current U.S. Drought Monitor (USDM) author expanded the D0 in the Four Corners region, covering more of San Juan County, UT to better match the current VegDRI conditions which show drought conditions throughout the southern portion of the basin (Fig. 8).

Status quo is recommended for the remainder of the UCRB for the current USDM map (Fig. 9).

A D4 introduction is being recommended for Alamosa County in the San Luis Valley. SPIs are very negative on many time scales and local experts indicate that D4 would be justified based on impacts. In the Arkansas basin, an adjustment of the gradient in Cheyenne County is recommended, moving the D0 and D1 lines to the north to better depict the dryness observed there.